

Applicant : S.R. Narayanan et al.
Serial No. : 09/489,514
Filed : January 21, 2000
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Attorney's Docket No.: 06618-406001

REMARKS

Claims 7-20 are pending in this application. Claims 15, 16, and 19 stand rejected under 35 U.S.C. 112, second paragraph, on the ground that the term "surface" lacks antecedent basis. The claims have now been amended by replacing "surface" with --side--, in accordance with the term used in the corresponding independent claims. Accordingly, this rejection should be withdrawn.

Claims 7-11, 13, 14, 18, and 20 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Serpico in view of the Dupont 30B reference and the Dupont Zonyl reference. The previous rejection of these claims under §102 based upon Serpico alone has been withdrawn. The Examiner acknowledges that Serpico does not describe the range of particle sizes recited in the claims. However, the Examiner now relies upon the two DuPont references to supply this feature. This rejection should be withdrawn for the following reasons.

The particles described in the DuPont 30B reference have a particle size of 0.5 micron. According to the Examiner, these particles fall within the claimed size range of "about" 1 micron to "about" 4 microns. Applicants disagree with the Examiner's characterization. Nevertheless, in the interest of expediting prosecution, applicants have amended claims 7, 13, 18, and 20 to delete the term "about." It is now even clearer that the claims exclude the particles described in the DuPont 30B reference. Accordingly, the combination of Serpico and the DuPont 30B reference cannot render the claimed subject matter obvious.

Turning to the DuPont Zonyl reference, the MP1100 particles described in this reference are the particles described in the present application as being suitable. However, merely finding multiple references, each describing individual elements of a particular claim, is insufficient to support an obviousness rejection. It is well-settled that two or more references cannot be combined absent some motivation to make the combination in the first place. Moreover, this motivation cannot be the result of a hindsight-guided determination. Hindsight, however, is precisely the basis for the proposed combination here.

Serpico, the primary reference, teaches a broad range of particle sizes spanning four orders of magnitude, from 0.05 μm to 500 μm (col. 2, lines 42-43), and preferably from 50 μm to

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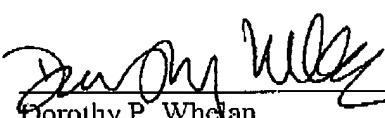
500 μ m (col. 2, line 58). Serpico, therefore, does not recognize the importance of controlling particle size within a narrow range generally, and certainly not within the specific range of 1-4 microns called for in the claims, for the purpose of making a catalyst ink. On the contrary, the implication in Serpico is that particles having a broad range of sizes are equally suitable. In view of this directive, there would be no reason for a person of ordinary skill to select particles having a very narrow size distribution of the type described in the DuPont Zonyl reference. Indeed, to do so would involve ignoring what Serpico teaches. This is impermissible. Accordingly, the rejection of claims 7-11, 13-14, 18, and 20 cannot stand and must be withdrawn.

The remaining rejections relate to various dependent claims and are based upon the Serpico and DuPont references discussed above, plus other references cited for allegedly describing additional features found in these dependent claims. It goes without saying that if the primary references fail to describe the subject matter of the independent claims from which these claims depend, then the rejection of the dependent claims must fail as well. No further argument based upon the additionally cited references is needed. Accordingly, these rejections must be withdrawn as well.

Attached is a marked-up version of the changes being made by the current amendment.

Applicant asks that all claims be allowed. Please apply any other charges or credits to Deposit Account No. 06-1050.

Respectfully submitted,

Date: April 7, 2002
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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the claims:

Claims 7, 13, 15, 16, and 18-20 have been amended as follows:

7. (Amended) A process for making a catalyst ink for a fuel cell, comprising mixing, at room temperature, components comprising water, particles of a fluorocarbon polymer with a particle size of [about] 1 to [about] 4 microns, and a catalytic material.

13. (Amended) A process for making an electrode assembly for a fuel cell, comprising:

(a) providing a catalyst ink comprising water, particles of a fluorocarbon polymer with a particle size of [about] 1 to [about] 4 microns, and a catalytic material; and

(b) applying the catalyst ink at room temperature to at least one side of a substrate.

15. (Twice Amended) The process of claim 14, further comprising roughening the [surface] side of the membrane prior to applying the catalyst ink.

16. (Twice Amended) The process of claim 15, wherein the [surface] side of the membrane is roughened by contacting the membrane with an abrasive selected from the group consisting of silicon nitride, boron nitride, silicon carbide, silica and boron carbide.

18. (Amended) A process for making a membrane electrode assembly for a fuel cell, comprising:

(a) providing a catalyst ink comprising particles of a fluorocarbon polymer with a particle size of [about] 1 to [about] 4 microns, and a catalytic material;

(b) applying the catalyst ink at room temperature to at least one side of a membrane;
and

(c) bonding the membrane to at least one electrode.

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19. (Twice Amended) The process of claim 18, further comprising roughening the side [surface] of the membrane prior to applying the catalyst ink.

20. (Amended) A fuel cell comprising a membrane electrode assembly, wherein the membrane electrode assembly is made by the process of:

- a) providing a catalyst ink comprising particles of a fluorocarbon polymer with a particle size of [about] 1 to [about] 4 microns, and a catalytic material;
 - (b) applying the catalyst ink at room temperature to at least one side of a membrane;
- and
- (c) bonding the membrane to at least one electrode.